

Regional Applied Research Effort (RARE) Project: Heavy-Duty Diesel Truck Activity Factors Analysis

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Although the importance of heavy-duty vehicle emissions, especially in urban areas, is acknowledged, there is a serious lack of knowledge with respect to the spatial and temporal operating characteristics of heavy-duty vehicles. Moreover, there are serious deficiencies vis-a-vis the “real-world” fleet mix that operates on roadways, as well as their engine, transmission, and cargo weight characteristics. The National Research Council (NRC) issued a report in 2000 titled “Modeling Mobile-Source Emissions” that discussed the U.S. Environmental Protection Agency’s (U.S. EPA) MOBILE5 model and its critical use as a tool to develop on-road emission estimates for State Implementation Plan emission inventories, atmospheric dispersion models, and transportation conformity analysis. The report noted that the nitrogen oxide (NO_x) emissions of heavy-duty diesel vehicles (HDDVs) are underestimated and emphasized that improvements to the HDDV emissions database and model are much needed. It added that better characterization of real-world emission rates is required.

As a consequence of the seriousness of the large role that HDDV emissions play in a non-attainment area, such as Atlanta, techniques are being evaluated to reduce HDDV emissions. These include the potential for an HDDV Inspection/Maintenance (I/M) program, HDDV retrofits, and special fuel formulations to reduce emissions. The U.S. EPA’s ORD/NRMRL/APPCD is working with Region 4 and the Georgia Institute of Technology to perform this work.

The goals of this research are as follows: (1) advance the state-of-the-science vis-a-vis the improvement of heavy-duty diesel emission factors, activity rate data, and emissions modeling and (2) develop a tool that would allow Region 4 to assess control strategies vis-a-vis heavy-duty truck emissions. Improved emission factor and activity rate data would be incorporated into improved modeling tools that would enable emission inventory and air quality modelers to develop and implement more effective HDDV emission reduction strategies. Moreover, it is anticipated that research from this particular effort would be evaluated for inclusion in future versions of the Mobile Vehicle Emissions Simulator (MOVES) model—the successor to the MOBILE model.